

ART. I.—*Some Bronze Age burial circles at Lacra, near Kirksanton.* By J. A. DIXON, with an excavation report by CLARE I. FELL.

Communicated at Carlisle, July 13th, 1948.

DURING the spring of 1947 I was asked by the Rev. W. S. Sykes of Birkenhead, one of the oldest members of this Society, to undertake an exploration of the ancient remains at Lacra, near Kirksanton. My original intention was to make a complete survey and to plot on the 25-inch O.S. map all antiquities existing in that area. The only previous written account of the site is the article by J. Eccleston of Silecroft, communicated at Millom on 29 August 1872;¹ that was by no means a complete record, and no attempt at excavation was made at the time, but Eccleston noted "a kirk, or keil called Old Kirk, two stone circles, three artificial platforms or terraces, an enclosure dyke, and an extensively furrowed surface."

In April 1947 a complete survey was made by Mr. K. Barlow (then studying engineering at Liverpool University) and myself, during which we were able to record various other remains not previously marked on the O.S. map (see fig. 1). In addition to the two clearly marked circles A and B, Old Kirk with its surrounding dyke and the field terraces already noted on the 6-in. and 25-in. O.S. maps, we discovered what appeared to be a small and irregular circle (D) with an extremely large central stone and an avenue and alignment proceeding W.N.W. and E.S.E. for a considerable distance from the circle; this

¹ CWI 278-281.

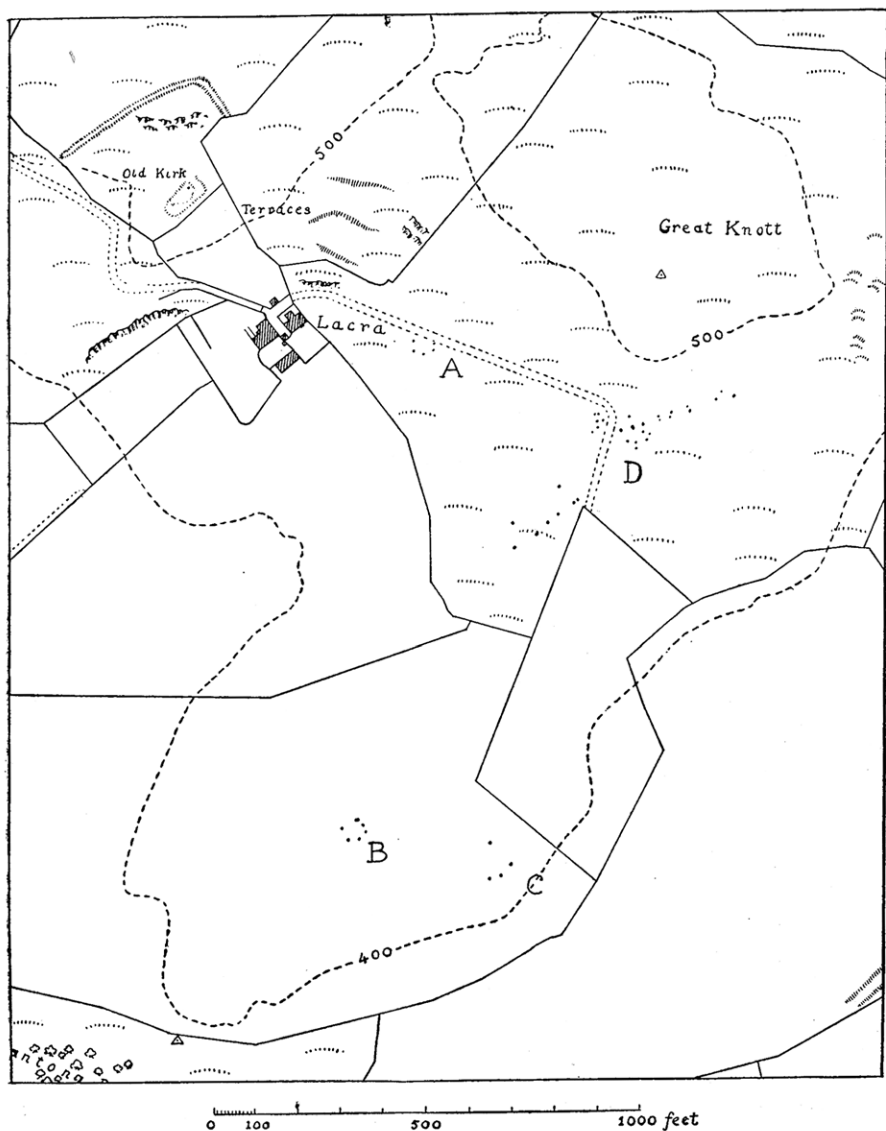


FIG. 1.—Based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office.

lay in the field called Great Knott, just below the 500-foot contour. In the same field as circle B we also found three stones standing together in semi-circle formation, which appear to be the remains of another circle (C), now mostly destroyed. Embankments and enclosures suggestive of a settlement site were found in the field lying south-west of Lacra farm; it is hoped to describe these in a future paper.

In consultation with the Hon. Marjorie Cross and Miss Clare Fell it was decided to trench at the base of the three stones mentioned above, and at the foot of one of the standing stones of the irregular circle in Great Knott field, in order to determine whether these stones had been placed there by man, or whether they were some of the natural boulders with which the hillside is strewn (a note on the geology of the site has been contributed by Mr. C. D. Ovey, and is printed as Appendix I below). This preliminary work was carried out in April 1947; and in July 1947 we excavated as much of the lower circle as time and labour would allow: Miss Fell's report on these excavations follows.

EXCAVATION REPORT, by CLARE I. FELL.

(i) *Circle C.* (Fig. 2).

On a natural terrace of a spur of the hill south-west of Lacra farm lie three stones marked C on fig. 1, which has been taken from sheets LXXXVIII 13 and 14 of the 25-in. O.S. map of Cumberland. The site is unrecorded; the arrangement of the stones in a segment of a semi-circle suggested that they had once formed part of a circle and were not naturally placed boulders (fig. 3). Trenches were therefore cut at the base of the three stones, to find whether there was any evidence to prove this point. Stone A, which was the largest, measured 5 ft. in length, with a maximum width of 3 ft. 5 in.; it had fallen outward from the centre of the circle, and packing-stones

surrounding a shallow socket were found on its north side. An oyster-shell lay close to its west side at a depth of 6 in. below the present turf. There was no trace of a socket hole by stone B, nor were any finds of interest recovered there. Stone C, again, had fallen outward, and a socket hole and packing-stones were found at its north

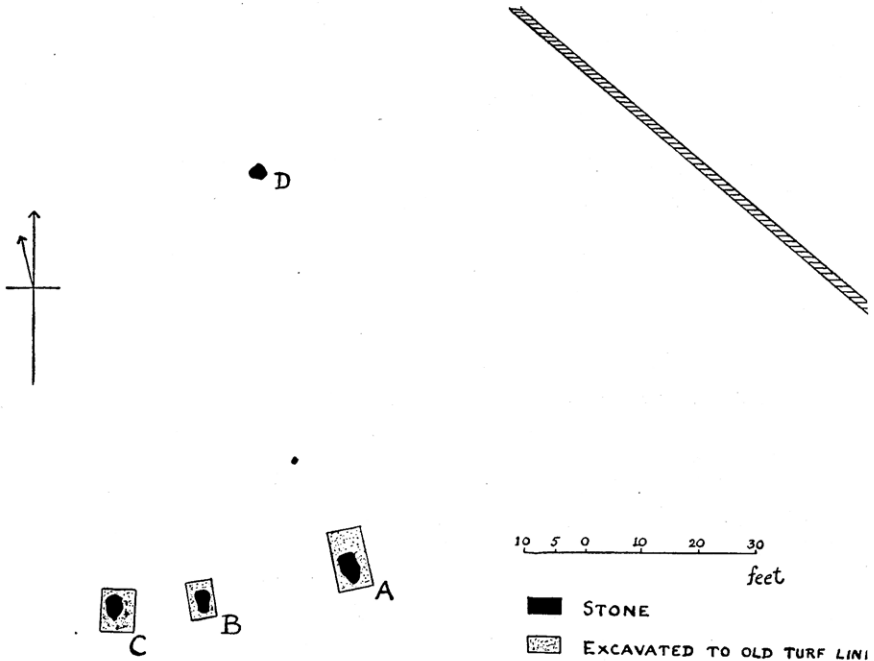


FIG. 2.—Plan of Circle C, Laca.

end; the ground underneath this stone had been disturbed by rabbits. There was a circular deposit of charcoal 1 ft. W.N.W. of it; the upper part of the deposit lay 10 in. below the present turf and continued for a further 5 in. in depth: the old turf line lay at a depth of 15 in. below the modern turf at this point. The charcoal was kindly examined by Dr. J. Cecil Maby of the Biophysical



FIG. 3.—CIRCLE C, LACRA.



FIG. 4.—CIRCLE D, LACRA

Photographs by G. E. Williams.

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Laboratory, Bourton-on-the-Hill, and was identified by him as common oak, probably from one or more fair-sized branches of wood that had since become badly collapsed and compressed. No pottery or other datable material was found, but it seems reasonable to claim that these three stones are the survivors from a circle of standing stones, approximately 70 ft. in diameter. A fourth stone, lying close to the natural outcrop of rock 70 ft. north of stone A, cannot be claimed definitely to belong to the circle, though its position suggests that it did. There is no trace of a central cairn or barrow showing above the turf.

(ii) *Circle D.* (Fig. 4).

Circle D, which lies in the field known as Great Knott just below the 500-ft contour, is so irregular in appearance that it seemed doubtful whether it was a circle at all. It was therefore decided to trench at the base of one of the standing stones. A trench 3 ft. 4 in. wide and 4 ft. long was dug on the western face of stone A (fig. 5); 8 in. below the present turf line the broken base of a cinerary urn was found: the urn lay in an inverted position and had been placed in a shallow hollow picked out of the rock surface close to the foot of the boulder (fig. 6). Its upper part was intact, though very fragile and traversed by cracks (fig. 7); the base must have been broken by the plough when the field was under cultivation. No packing-stones were found at the foot of the monolith, which was an unshaped boulder of local volcanic ash; it rested on undisturbed pinnel, a thin layer of which overlies the solid rock at this point. Except for a few fragments of charcoal and pottery from the broken part of the urn, nothing further of interest was found. No further work was carried out at Circle D, but the site is definitely proved to be a burial circle.

The survey of the site by K. Barlow and J. A. Dixon (fig. 5) shows a circle 51 ft. in diameter E.-W. by 60 ft.

GREAT KNOTT

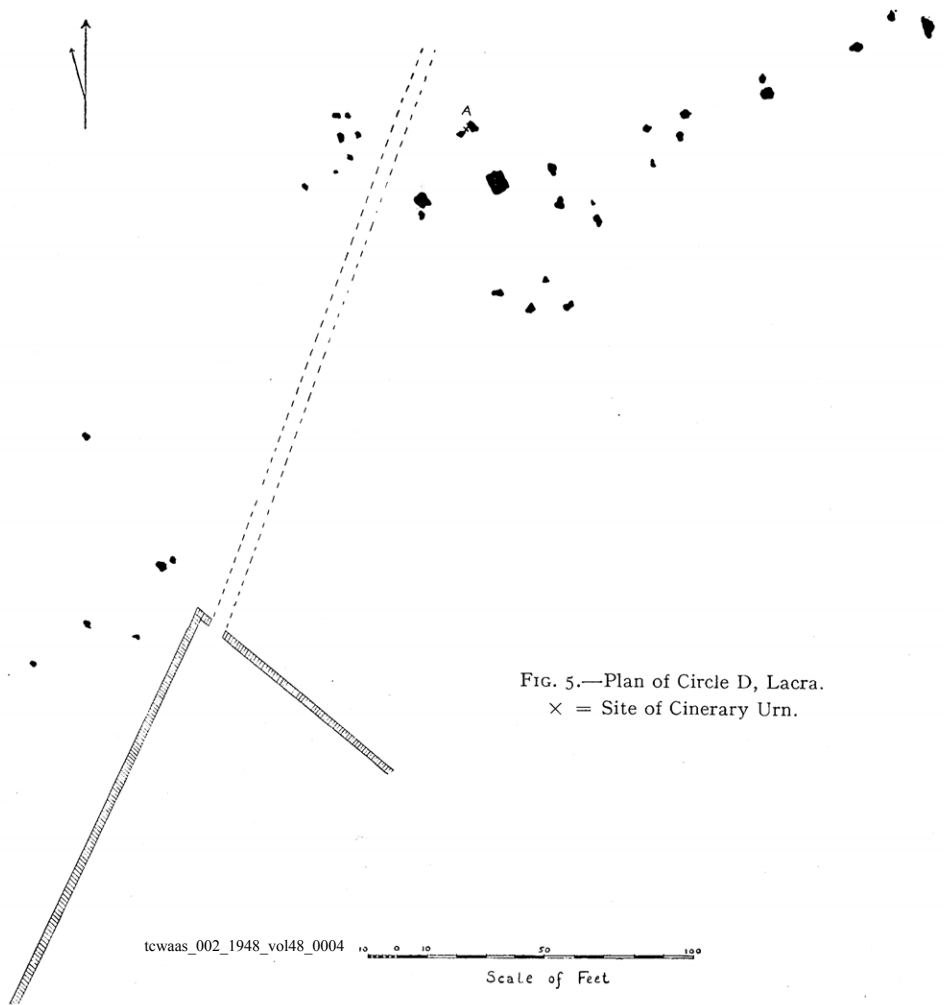


FIG. 5.—Plan of Circle D, Lacra.
× = Site of Cinerary Urn.

N.-S. The large, flat central stone measures 8 ft. by 6 ft.; an alignment of 10 stones, some arranged in pairs, runs for 152 ft. E.N.E. from the circle. What may have been an avenue 50 ft. wide extends for 345 ft. to W.S.W.; many of the stones on its northern side are missing. The hillside is strewn with natural boulders, and it is difficult to claim without excavation which stones actually belong to the monument. On the south-east side of the circle an outer ring of stones can be traced, but this double ring does not

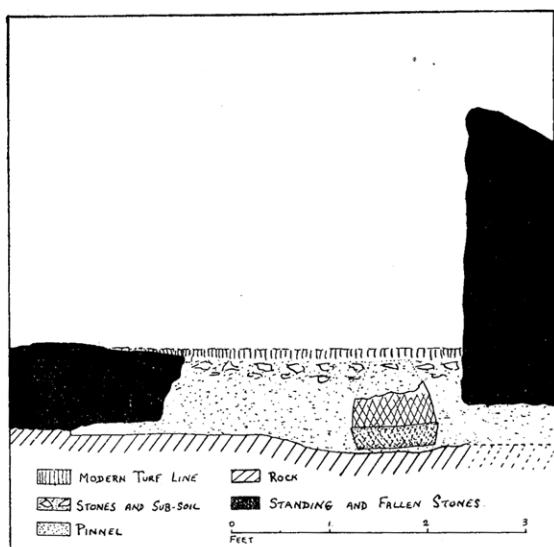


FIG. 6.

show on the north side; 25 ft. to the north-west lies what remains of a small circle 16 ft. in diameter, also with a central stone. No trace of a barrow or cairn can be seen within the area contained by these circles, but plough-marks traverse the whole hillside, and any mounds previously existing may well have been removed when the field was under cultivation, the stones being used to build

the walls. The central stone of the larger circle and that of the smaller one look like cap-stones of cists and not fallen monoliths.

I do not know of any close parallels to circle D in our district. The megalithic character of the central stone and of some of the surrounding stones is unusual here; in addition, there are few records of alignments and avenues in the Lake Counties. Perhaps the closest comparison is with a cairn surrounded by a stone circle, and having a large central stone which once lay at the south end of the avenue of standing stones at Shap,² though the Shap avenue itself was a far more spectacular affair. There is a short avenue at the embanked circle known as the Kirk at Ghyll House Beck, Kirby Ireleth.³ Circles connected with alignments occur in Scotland and other parts of the Highland Zone, such as the small circle at Mynydd Bach, Trecastell, Brecon,⁴ and the High Bridestones, Grosmont, in north-east Yorkshire.⁵ Circles with central standing stones are not common: a group occurs on the Scottish side of the Solway,⁶ their distribution being shown in a map recently published by Mrs. Margaret Davies;⁷ in central Wales there is another group of circles of this type,⁸ and they recur in Cornwall. As it is doubtful whether the central stone at Lacro, Circle D, was ever set in a standing position, this line of comparison need not be pursued further.

It is not an uncommon feature for cinerary urns to be found at the foot of stones at the periphery of a circle. At Leacet Wood, near Penrith, seven urns were found in such a position.⁹ At Birkkrigg, near Ulverston, cremation

² *Arch. Journ.* xviii, 1861, 27.

³ *Archaeologia* liii 417 (H. S. Cowper).

⁴ *Arch. Camb.*, 1854, 125.

⁵ Elgee, *Early Man in North-East Yorkshire*, 104 f.

⁶ *PSAScot.* liv 155 f.

⁷ *Ant. Journ.* xxv 142.

⁸ W. F. Grimes, $\frac{1}{4}$ -in. O.S. map sheet 7, *Megalithic Map of South Wales*, 1936.

⁹ *CW* i v 76.

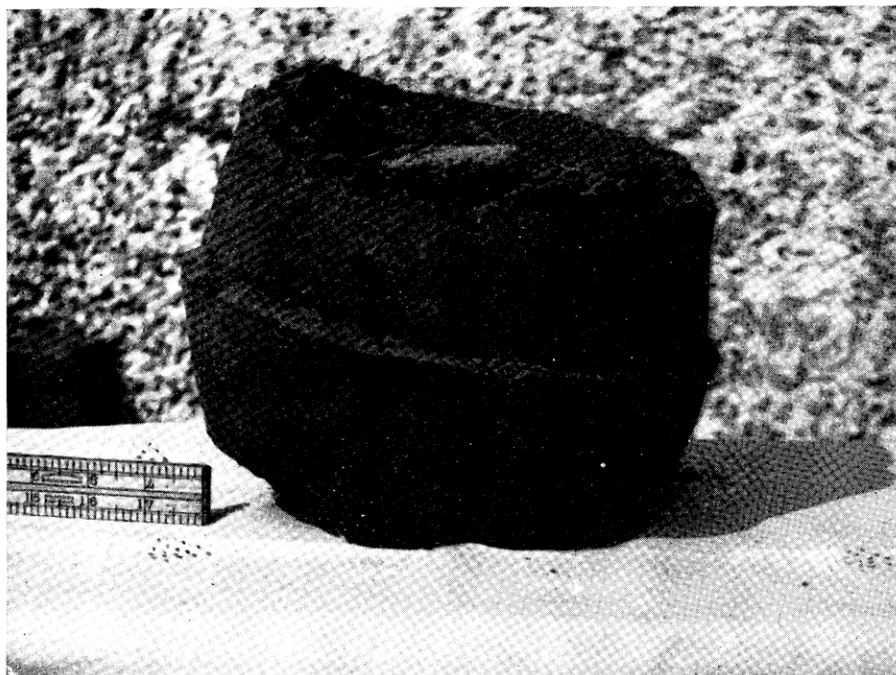


FIG. 7.—CINERARY URN FROM CIRCLE D, LACRA.



FIG. 9.—CIRCLE B, LACRA.

burials are recorded similarly placed.¹⁰ Examples of this type of burial occur in Scotland, and include sites such as Cunninghar, near Tillicoultry¹¹ and the smaller circle at Broomend of Critchie, near Inverurie.¹² Such burials are usually secondary deposits and do not date the original construction of the monument with which they are connected, but indicate that the sites were still sacred at the time of interment.

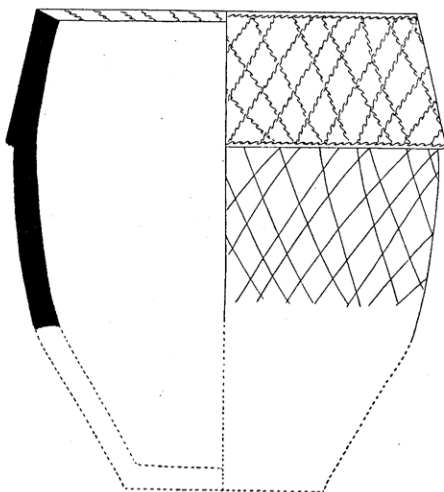


FIG. 8.—Reconstruction of Cinerary Urn from Circle D, Lacro. $\frac{1}{4}$

The urn (figs. 7 and 8) is of overhanging-rim type, characteristic of the Middle Bronze Age; it is of Abercromby Type I, Phase iii, or Type A IV of Grimes's more recent classification.¹³ The collar, which is $2\frac{3}{4}$ inches deep, is ornamented by criss-crosses of cord impression enclosed by a single row of similar ornament encircling the pot just below the rim and just above the lower edge

¹⁰ CW2 xii 262 f.

¹¹ PSAScot. xxix 190.

¹² PSAScot. liv 155 f.

¹³ W. F. Grimes, *Guide to the collection illustrating the Prehistory of Wales*, National Museum of Wales, Cardiff, 1939.

of the collar. The rim has a slight internal bevel but no thickening, and is decorated by short, unevenly spaced diagonal lines of cord impression. The area between the collar and the shoulder is covered with roughly incised lattice pattern for a depth of $3\frac{1}{4}$ inches; below the shoulder the urn appears to have been plain. The whole of the base and most of the lower part of the body of the vessel are missing. The shoulder is rounded and forms no definite angle with the body of the urn; the neck has flattened out, and the whole approaches the bi-conical form, one of the types into which the overhanging-rim is thought to have degenerated. The urn is of coarse ware, probably made from the local boulder-clay and stiffened with added grits; it is fired red-brown on the outer surface, blackish-brown on the inside. The walls average half an inch in thickness; the external diameter of the rim is $7\frac{3}{4}$ inches, and the greatest diameter, which is at the lower edge of the collar, is 9 inches. The urn is hand-made and has been built up by the coil method: this fact was clearly shown by the way in which it fractured.

Urns from the Birkrigg circle,¹⁴ Beck farm close to Lacra,¹⁵ and Holmrook,¹⁶ are all of earlier form; the latter bears the characteristics of the Pennine Urns identified by W. J. Varley.¹⁷ The larger urn from the Banniside Moor circle, near Coniston, is more comparable in type.¹⁸ A bi-conical urn, which is a later development, was also found at the latter circle. Accurate dating of cinerary urns is difficult, owing to the rarity of associated grave-goods and to their frequent destruction during the cremation. At Stainton Head, near Dalton-in-Furness, a bronze implement described as a spear-head was found in an urn of overhanging-rim type:¹⁹ but unfortunately

¹⁴ CW2 xii 262.

¹⁶ CW2 xliv 161 and plate.

¹⁷ *Ant. Journ.* xviii 164 f.

¹⁸ CW2 x 349 f. and plates.

¹⁹ J. Bolton, *Geological Fragments*, 1869, 138 f.

¹⁵ CW2 xxxix 283, pl. iii.

no illustrations of these finds exist, and their present whereabouts is unknown; the description of the ornamentation of the urn compares closely with that on the urn under discussion. The Lacra urn is a later development of the series, common throughout the north-west of England, which includes the urns from the central burial in the unique timber circle at Bleasdale, near Garstang.²⁰ Professor Gordon Childe does not consider that the Bleasdale urns can date before period V of his chronology.²¹ Middle Bronze Age sepulchral pottery types have been demonstrated by him and by Sir Cyril Fox to have continued in use in parts of the Highland Zone as late as the end of period VII (i.e. 300 B.C.), while W. J. Varley and J. W. Jackson, in their work on Prehistoric Cheshire, maintain that no new pottery forms were introduced there until the coming of the Iron Age A2 hill-fort builders about 250 B.C.²² In the Lake Counties late types of overhanging-rim urns, encrusted and cordoned urns, continued in use until the second century B.C. or possibly even until the coming of the Romans. Large hill-forts, with the possible exception of that on Carrock Fell, do not exist here, and Early Iron Age culture is only represented by a few metal types—which will have reached the district as objects of trade. It is therefore suggested that the urn from Lacra, Circle D, dates from the later part of Childe's period V, i.e. between 1000 and 750 B.C., at a time preceding the development of the encrusted and cordoned urns, both of which types are represented in our area.

Charcoal found immediately round the urn and inside it has been examined by Dr. J. Cecil Maby, who describes it as "common oak from knotty branches of small size, one fragment of hazel wood and half a hazel kernel";

²⁰ *Ant. Journ.* xviii 156-168.

²¹ V. G. Childe, *Prehistoric Communities of the British Isles*, 151.

²² W. J. Varley, J. W. Jackson and L. F. Chitty, *Prehistoric Cheshire*, 43.

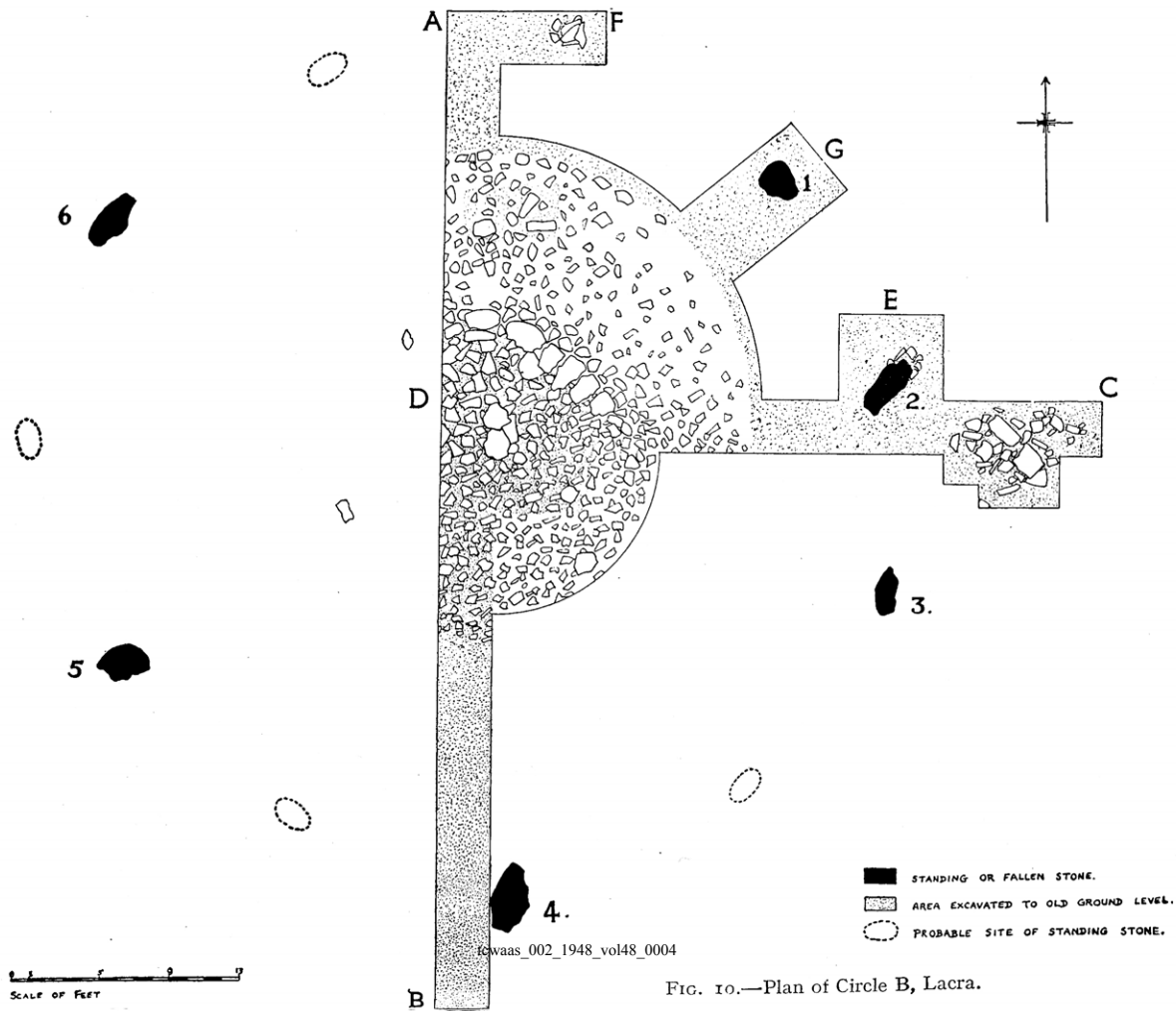


FIG. 10.—Plan of Circle B, Lacia.



FIG. 12.—STONE 2, CIRCLE B, LACRA.

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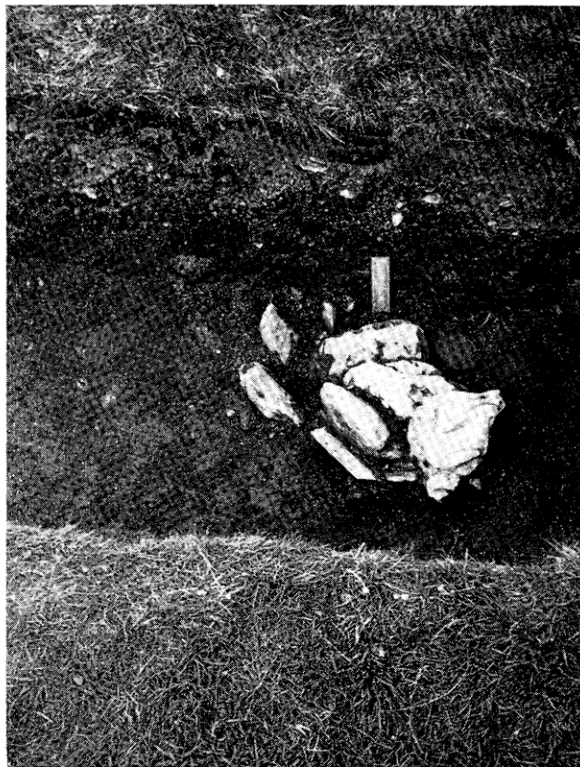


FIG. 13.—SOCKET OF MISSING STONE IN TRENCH A-F,
CIRCLE B, LACRA.

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the burial, therefore, appears to have taken place in the autumn.

The urn has been deposited on loan in the Barrow-in-Furness Museum.

(iii) *Circle B.* (Figs. 9-11).

Work at Circle B was carried out during July 1947. Owing to bad weather conditions in the early part of the month, it was not possible to complete the excavation of the site. All the work was carried out by voluntary labour; it was decided to concentrate on one quadrant at a time, and to extend the work if circumstances allowed. The main features were as follows:—

(a) *Circle of standing stones.*

Six unshaped stones, averaging 3 ft. 6 in. in height, remain; nos. 1, 3 and 5 are standing and 2, 4 and 6 have fallen. They are arranged in a circle 48 ft. in diameter. Stone 2 had fallen south-westward; its packing-stones and socket showed clearly on the north side (fig. 12); the base of this stone was equidistant from nos. 1 and 3, suggesting that five stones are now missing from the peristalith. A trench A-F was consequently cut, and the packing-stones and socket-hole of a missing stone were found (fig. 13): the socket had been hollowed out to a depth of 8 in. below the old turf line. The circle seems to have been composed originally of eleven evenly-spaced stones; the removal of alternate ones was probably carried out at the time that the hill was under cultivation, to facilitate the passage of the plough. Trench G was cut to show one of the stones in its original setting (fig. 14); packing-stones encircling it are on the old turf line, which was found 20 in. below the present turf at this point. Flecks of charcoal were discovered close to the foot of stone 1 at that level.

(b) *Central mound.* (Fig. 15).

A low mound of earth and stones, mostly small in size, had been built inside the stone circle; its outer edge lay

CROSS-SECTIONS OF BURIAL CIRCLE AT LACRA, NEAR MILLOM. (B)

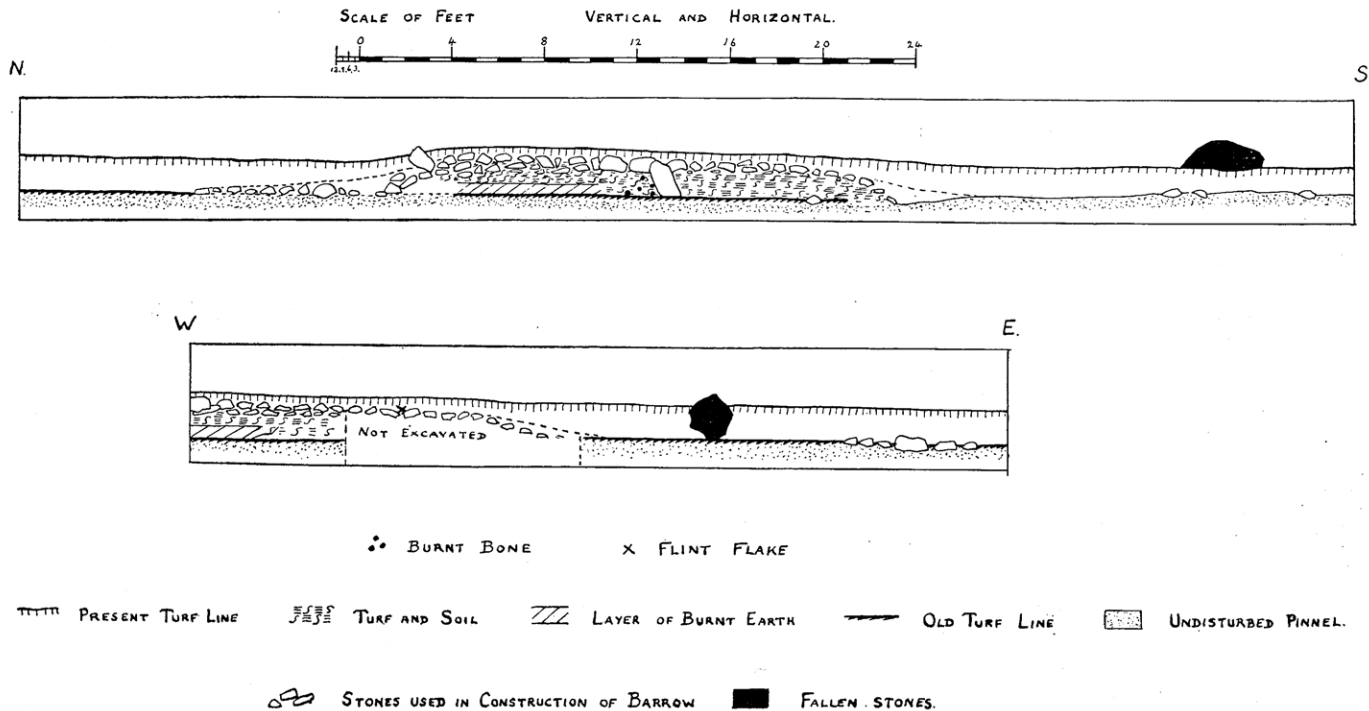




FIG. 18.—CENTRAL FEATURE, CIRCLE B, LACRA.



FIG. 19.—TRENCH C-D, CIRCLE B, LACRA, showing stones lying on the old ground level outside the peristalith.



FIG. 16.—CENTRE OF CIRCLE B, LACRA, after excavation, looking east.



FIG. 17.—CENTRE OF CIRCLE B, LACRA, after excavation, looking north.

Photographs by J. Barratt.

Facing p. 15.



FIG. 14.—STONE 1, CIRCLE B, LACRA.

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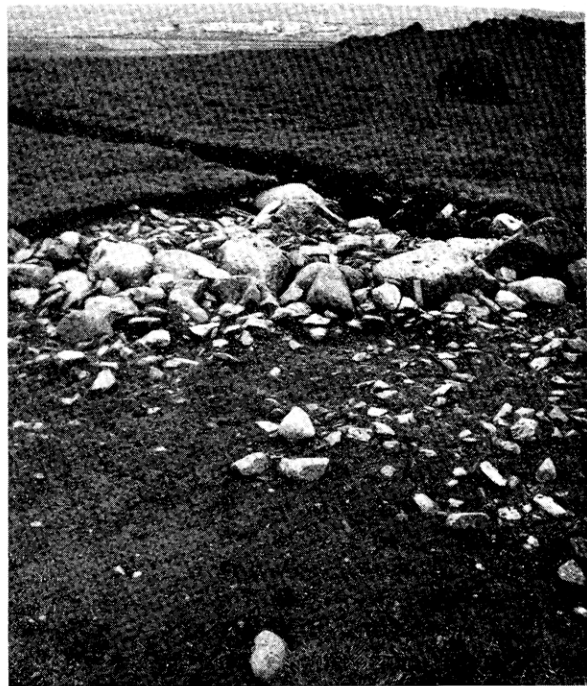


FIG. 15.—NORTH-EAST QUADRANT, CIRCLE B, LACRA.

6-8 ft. inside the ring of stones, its diameter was 32 ft. and on the north-west side its outer edge was clearly defined by an arc of stones placed on the old ground surface. This stone setting could not be traced further round the segment, nor was it met with at the southern edge of the mound in trench A-B. The mound sloped gradually upward to a height of 2 ft. above the old turf line at its centre. Charcoal in small fragments was found over the whole area from 10 in. below the present surface down to old ground level; the only other object of interest which was recovered was a small flake of flint, which lay near the top of the mound, close to the inner ring of stones.

(c) *Inner ring of stones.* (Figs. 15-17).

Nine feet inside the edge of the mound, part of a ring of large stones, up to 2 ft. in length, was uncovered; these seem to form an inner circle, 14 ft. in diameter, lying on top of the mound, with their long axes pointing to the centre. The stone of this ring which lay in the trench A-B had been torn from its seating by the plough, and showed above the present turf; this must have been the one mentioned in Eccleston's account as a central stone. All the stones of the inner ring were scored with plough-marks. Only one was found in the south-east sector, and what are probably two more show through the turf on the western side of the circle; they are shown in the plan (fig. 10). Inside the ring the mound was much stonier, and a group of large stones marked what was judged to be the centre.

(d) *The central area.* (Fig. 18).

Excavation of the area inside the inner ring was next carried out. The construction of the mound in the centre was of turf and earth, with a facing of stone at the top; this shows clearly in fig. 18. When clearing trench A-B down to the undisturbed pinnel, it was found that the old turf line ended abruptly 21 ft. 10 in. from the south

end of the trench, suggesting that the turf from the southern part of the circle had been stripped off and used to heap up over the central burial. Charcoal occurred frequently inside the central area, and a layer of earth, reddened by heat, extended north and east of the cluster of large stones which mark the centre of the mound. The southern part of the central area had been disturbed, and much of the stone facing had been removed. We isolated the central feature before taking away the large stones and examining the earth beneath them; a few fragments of burnt bone were recovered (all lying beneath the big stones and above the old turf line), but neither pottery nor other datable material were found. We then cleared the inner area and scraped it down to the undisturbed pinnel, from the top of which half a flint pebble was recovered. There was no trace of any burial pit: the primary burial, which was by cremation, must have rested on the old land surface. The base of one of the central stones, as can be seen in the section, touched the old turf line; it seemed to me that these stones may originally have formed part of the inner ring, and have been thrown here to mark the spot from which the central burial had been taken when the southern part of the mound was disturbed—on the other hand, they may have formed a rough protection to the primary burial. Certainly they have been in their present position for a long time, as they are scored with plough-marks, and the last date at which Lacra was ploughed was beyond living memory when Eccleston wrote his account of the site in 1872.

(e) *Possibility of a ditch.*

Trench A-B was cut 8 ft. beyond the stone circle, but no ditch could be traced in this area; in fact the underlying rock comes very near to the surface here. Trench C-D was therefore extended 10 ft. east of stone 2, revealing

not a ditch but a curious arrangement of stones lying on the old turf line (fig. 19). It was at first thought that the large rectangular slab might cover a secondary burial, but nothing was found beneath it. The stones of this group continued into the south bank of trench C-D, and were followed for a distance of 2 to 3 ft., where they seemed to end; time did not permit any further investigation, but two possibilities are suggested: *either* this group of stones forms part of a ring encircling the standing stones, *or* heaps of stones may have been assembled at the main cardinal points, to help in the construction of the circle. It must be left to a future excavation to determine whether there was in fact a ditch.

The charcoal from Circle B has kindly been examined for me by Dr. A. R. Gemmell of Manchester University, who identifies it all as *ash*, except for one very small piece which may be *birch*, though the fragment was too small to yield a sufficiently good section for certain analysis; this contrasts with the *oak* and *hazel* identified in the charcoal from Circles C and D. Soil samples from Circle B were examined by Professor F. E. Zeuner, of the Institute of Archaeology, London University, to whom I am indebted for a report (Appendix II); it has not been possible for him to reach more conclusive results, as I did not forward a large enough series of samples for comparison.

Circle B is of similar type to Circle A at Lacra. Burial circles have a wide distribution in the Highland Zone. More frequently, small stone circles once surrounded the base of cairns which have since been destroyed; here the circle lies well outside the mound which it surrounds. Burial circles occur in Scotland²³ and in Wales, where a cairn circle at Dyffryn Syfynwy, Prescelly, may be compared.²⁴ Cairn circles and ceremonial circles in the

²³ PSAScot. xviii 341.

²⁴ *Arch. Camb.*, 1911, 296.

area covered by this Society lie in two main groups, namely the Eden valley and the West Cumberland coast; outliers are found in the main valleys of the Lake District (as at Keswick, Troutbeck and Torver), while sites at Casterton, Yealand and Birkrigg, near Ulverston, point to a coastal movement in addition to the contact made across the Pennines with Yorkshire. The double circle at Oddendale, near Crosby Ravensworth, is similar in type to Laca B, and contained burnt material near the centre.²⁵ Another double circle at Birkrigg, near Ulverston, was excavated in 1912 and 1921;²⁶ the report does not make it clear whether a mound is thought to have covered the inner circle, which was 25-30 ft. in diameter; a small, squat, overhanging-rim urn of Abercromby Type 1 Phase ii was found 4 ft. west of the centre, and may have been the primary burial: it probably dates early in Childe's period V. A barrow on Appleby Hill, Birkrigg, 36 ft. in diameter, contained a circle of stones 12-13 ft. in diameter, which compares with the inner ring at Laca B;²⁷ the primary burial there had been by inhumation, and was accompanied by a small bronze tattooing-awl, a type which has been found associated with a beaker,²⁸ and with a flat bronze axe in the Butterwick hoard, and is therefore assumed to be of Early Bronze Age date (Childe's period III or IV). At Sizergh Fell, Professor T. McKenny Hughes found a food-vessel of unusual type, showing marked Beaker influence, inside a barrow which had a ring of large stones at its base.²⁹ In the Eden valley three sites may be mentioned for comparison:—

(1) Standing Stones, a small stone circle on Moor

²⁵ CW1 vi 178 and CW2 xxxiii 220.

²⁶ CW2 xii 262 and xxii 346.

²⁷ CW2 xiv 468 f.

²⁸ Bateman, *Ten Years Digging in Celtic and Saxon Grave Hills in Derby, Stafford and York*, 155.

²⁹ CW2 iv 71 f.

Divock which was excavated by Canon Greenwell, and contained a food-vessel of Abercromby Type IA accompanying a cremation.³⁰

(2) The Maughonby Circle, known as Little Meg, where engraved spirals and cup and ring marks were found on two of the stones encircling a cairn, and on the cap-stone of the central cist; an "urn" and burnt bones were found in the cist, but the whereabouts and type of the urn are unknown.³¹

(3) The Leacet Wood circle, near Penrith, quoted above (p. 8), which yielded a number of cinerary urns; at the centre was a burnt deposit, and a semi-circle of smaller stones formed part of an inner circle: the report does not say whether there had at one time been a cairn in the centre.

Stone circles have most frequently been found surrounding burials accompanied by food-vessels, but circles do sometimes surround primary cremation burials in urns of overhanging-rim type, as at Hutton Buscel in the North Riding of Yorkshire³² and the Flaxdale barrow at Middleton in Derbyshire.³³

The composite nature of the mound at Lacre B is interesting and unusual in this district, where stone is abundant and cairns are more common than barrows. Recent work by Sir Cyril Fox has revealed a number of composite barrows in South Wales, and a discussion of their origin and distribution is given in his paper on the Simondston and Pond cairns.³⁴ Though the South Wales barrows are of different type from Lacre B, their composite construction makes an interesting comparison, particularly if one bears in mind that the old Atlantic route, used by the builders of megaliths, continued in use throughout the Bronze Age.

³⁰ W. Greenwell, *British Barrows*, 400 f.

³¹ CW1 vi 111 f. and CW2 ii 381 f. with plates.

³² W. Greenwell, *British Barrows*, 369, no. clviii.

³³ Bateman, *Ten Years Digging etc.*, 62.

³⁴ *Archaeologia* lxxxvii 160 f.

The primary burial at Lacro B was by cremation. The remains were not contained in a cist, or in a pit below the old ground surface; the central burial may have been marked and protected by the large stones which were found at the centre. The stones of the peristalith are small and not of megalithic character; the circle appears to be later than Lacro D and more closely comparable with Oddendale and the double circle at Birkrigg: on the other hand it is earlier in type than the ring-cairn on Banniside Moor mentioned above (p. 10), or than the urnfield at Kirby Ireleth just across the Duddon.³⁵ Most probably Circle B was built during the first half of period V of Childe's chronology, i.e. 1400-1000 B.C., at a time when the construction of burial mounds and the ritual connected with the burial of the dead were still of great importance.

It remains for me to record our thanks to the owner, Mr. J. W. Brockbank of Kirksanton, and to his tenant Mr. Reid, for permission to dig; to the Lonsdale Estates, as Lords of the Manor, for covering permission; to all those who helped to dig, especially to K. Barlow, A. J. Barrett, W. T. Newby, the Rev. J. and Mrs. Eckersley, the Hon. M. Cross, Miss H. Harris and Miss M. Benn; to G. E. Williams, T. N. B. Horsefield and J. Barratt for photographic work; to Mr. T. Benn for the loan of maps, and above all to Mrs. A. J. Barrett of Low Lowscales for the many good teas which she provided. For expert reports I am indebted to Professor F. E. Zeuner, Mr. C. D. Ovey, Dr. Cecil Maby and Dr. A. R. Gemmell, and I would also thank Miss L. Chitty and Mrs. Margaret Davies for providing references.

³⁵ Barber, *Furness and Cartmel Notes*, 37 f.

APPENDIX I.

GEOLOGICAL NOTE ON THE STONE CIRCLES OF LACRA,
by C. D. OVEY, B.Sc., F.G.S.

The site of the circles under discussion is situated on a spur of the Borrowdale Volcanics lying southeast of the fault which separates these rocks from the small inlier of Skiddaw Slates of which Black Coombe is composed. The circles lie on a high ridge roughly half way between Millom to the southeast and Black Coombe to the northwest, and rest on relatively level ground forming "terraces" overlooking the Irish Sea beyond the narrow coastal plain to the southwest.

The stones of the circles are all derived from the Ordovician Borrowdale Volcanic Series and consist of finely banded and coarse ashes, vesicular lavas with zeolites and explosion breccias typical of the Lake District. The individual rocks making up the circles could not be "matched" in the field without careful petrological examination, but it is evident that they were derived from the Cumbrian Hills.

It seems likely that ice was originally responsible for the presence of the great boulders and that they had been left on the terraces of this ridge as erratics by the glaciers which flowed down the Duddon Valley on the one side and the Whicham Valley on the other from the local ice centre of the Central Cumbrian massif. This probably accounts for odd boulders scattered about which are otherwise difficult to bring into any humanly constructed alignment (Fig. 5). At the same time the constructors of the circles had no distance to go to find their stones, which must have only been moved a few yards from the original spot where the ice had left them.

APPENDIX II.

REPORT ON SOIL SAMPLES FROM CIRCLE B AT LACRA,
by PROFESSOR F. E. ZEUNER, D.Habil., Ph.D., F.G.S.A. *Old turf line underlying burial circle at Lacra (?)*

Contains fragments grading from 3 cm down to silt. A few fragments of charcoal are present in the grade between 3 and 1 mm. Humus is present in abundance and the reaction is pronouncedly acid (pH=5.8). No recent plant fibres.

The material is probably derived from the A₁-horizon of a podsol soil and to that extent the presence of a turf line is suggested. But the admixture of charcoal would imply that the

soil was disturbed, and it may not be in situ where the sample was taken.

B. *Soil from among stones of the cairn at burial circle, Lacra.*

Composition as in (A), but charcoal more frequent, and recent plant fibres present. Very rich in humus and acid. (pH = 6).

Pedologically, this is part of an acid top soil (like A) and possibly part of the modern soil profile, since root fibres are present.

C. *Reddened layer of soil in centre of cairn in circle at Lacra.*

Composition as in (A) and (B), but charcoal less frequent than in (C); root fibres present. Distinguished from (A) and (B) by its colour (ochre). Less humus present, but even more acid (pH = 6.2).

It is probable that the yellow colour of this deposit, which in its physical composition is identical with the brown of greyish-brown deposits, (A) or (B), is, broadly speaking, connected with its smaller humus content. The lumps of fine earth contained in the sample do not suggest direct action of fire. Charcoal is present, however, so that remains from fires have become incorporated in this material. Some of the coarse rock-fragments are slightly more reddish than the fine earth, and when fractured reveal a reddened outer layer as usually observed in burnt rock-fragments. It is possible therefore that this layer contains material derived from hot fires, and that its smaller content of humus is connected with this derivation. Its great acidity may be secondary.